

Development of Reading Enrichment Books Integrating Humanistic Values and 21st Century Skills for Pre-Service Teachers

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ABSTRACT

This study aims to develop and measure the effectiveness of early reading enrichment books that integrate humanist values, 21st-century skills, and entrepreneurial dimensions for primary school students. **Based on needs analysis**, the enrichment books are designed not only to improve reading skills but also to support the development of critical thinking, collaboration, empathy, and creativity. **The results** from the pretest and posttest show a significant improvement, with an average pretest score of 45.50 and a posttest score of 75.10, showing a difference of 29.60 points. Analysis using the paired t-test produced a t-value of -10.99 with a significance value (p-value) of 0.000, indicating that the difference in learning outcomes is statistically significant. **This research** is also supported by several recent literatures that highlight the importance of integrating 21st-century skills, entrepreneurial dimensions, and humanist values in learning. **Although the results** of this study are positive, there are some limitations, such as the limited sample size and focus solely on reading skills. **Further research** is recommended to expand the range of skills measured, as well as to link the use of technology, local culture, and examine the long-term effectiveness of these enrichment books.

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1. INTRODUCTION

The ability to teach early reading is a fundamental skill for prospective primary school teachers, as early reading forms the foundation for lifelong learning and academic success. According to [1], every child deserves a competent reading instructor to support their motivation and academic achievement. Research confirms that phonemic awareness and phonics are crucial elements in predicting long-term reading development, making these skills essential for teachers to master [2]. However, teaching early reading is not an easy task. Besides mastering phonics, teachers must also understand the cognitive and environmental factors that influence literacy development [3].

Unlike previous studies that primarily focus on phonemic awareness and phonics for early reading, this research introduces an innovative approach by incorporating humanistic values, 21st-century skills, and entrepreneurial dimensions. These elements are integrated through interactive learning strategies, digital tools, and cultural adaptations that enhance both literacy and professional development for pre-service teachers.

Moreover, this study also expands the scope by considering the commercialization potential of enrichment books through edupreneurship and digitalpreneurship. The complexity of preparing prospective teachers to teach reading effectively, emphasizing the need for a solid theoretical and practical foundation [4]. Unfortunately, various studies indicate significant gaps in teacher training. [5] state that teachers cannot teach skills they do not possess, while [6] found that teacher expertise in phonology and explicit instruction directly correlates with improved student reading outcomes. In addition to mastering foundational literacy, early reading instruction must adapt to 21st-century demands, including the development of critical thinking, collaboration, and cultural awareness [7]. While the importance of integrating 21st-century skills in education is well-documented, this study advances the field by providing an applied framework through early reading enrichment books. Unlike previous works that separately address literacy and soft skills development, this research combines both aspects within a structured learning resource, ensuring pre-service teachers are equipped with critical thinking, collaboration, and creativity skills essential for modern classrooms. According to [8], effective reading instruction also involves diverse strategies and texts to enhance student engagement. This view aligns with the Partnership for 21st Century Skills (P21) framework, which emphasizes skills such as flexibility, adaptability, and leadership to prepare learners for modern challenges.

2. LITERATURE REVIEW

Technological innovations like Natural Language Processing (NLP) and machine learning enable automatic analysis of phonological variations, enhancing early reading instruction by addressing dialectal differences [9]. NLP tools identify patterns in students' reading errors, helping teachers tailor instruction to individual needs [10]. This study utilizes NLP techniques, including text analysis, speech recognition, and automated dialect mapping, alongside machine learning models like Support Vector Machines (SVM) and Recurrent Neural Networks (RNNs), to provide adaptive feedback [11]. This approach ensures the enrichment book adjusts to regional dialects, promoting personalized and inclusive learning. By integrating speech recognition and dialect mapping, educators can create culturally responsive teaching materials, enhancing student engagement and comprehension [12].

To realize its edupreneurship potential, the enrichment book can be monetized through digital platforms, subscription-based access, and integration into e-learning applications. Case studies of successful products, such as interactive e-books and AI-driven learning platforms, demonstrate the effectiveness of gamification and digital transformation. A business model for commercialization includes collaboration with educational institutions and ed-tech startups to distribute digital versions through cloud-based libraries and mobile applications [13]. Edupreneurship enhances early reading education by transforming educational resources into innovative products that promote learning and cultural preservation. The proposed enrichment book can be adapted into interactive applications or digital platforms, providing access to quality reading materials while creating entrepreneurial opportunities for educators. Technology-based learning tools not only improve student outcomes but also enable the development of marketable educational products.

Through digitalpreneurship, the proposed enrichment book can also be monetized via platforms such as e-learning applications, subscription-based teaching resources, or digital teaching aids. The monetizing learning platforms, such as interactive e-books and digital teaching modules, provides economic opportunities for educators while improving access to learning resources [14]. The proposed enrichment book has the potential to be adapted into such a digital platform, offering sustainable educational solutions while empowering educators and educational developers economically. This research directly supports the Sustainable Development Goals (SDGs), particularly SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities). By equipping teachers with tools and skills to deliver inclusive and effective early reading instruction, this study contributes to improving access to quality education for all students, including those in marginalized communities.

Moreover, integrating humanistic values ensures that education promotes respect for diversity and creates equal opportunities, addressing disparities in learning outcomes. Developing technology-based educational resources can increase access to quality education, especially in remote areas [15]. Additionally, how humanistic values in education reduce social inequalities through inclusive learning that values cultural diversity and individual needs [16]. Existing enrichment books, such as those by [17], focus on technical reading skills and strategies [17–19]. However, these books fail to integrate humanistic values, 21st-century skills, entrepreneurial dimensions, and technological innovations like NLP. This highlights the need for enrichment books that not only build early reading skills but also foster empathy, cultural awareness, adaptability, and re-

sponsiveness to linguistic diversity key components of humanistic education [20]. This research introduces an enrichment book that integrates humanistic values, 21st-century skills, and dialectology-based technology for early reading instruction. It combines theoretical insights with practical strategies to enhance teaching competence while promoting flexibility, independence, and leadership, aligning with the Career and Life Skills (CLS) framework of P21. The study aims to design and evaluate the book's effectiveness in enhancing early reading instruction for prospective primary school teachers, equipping them for modern classrooms while exploring its potential in edupreneurship, creativepreneurship, and digitalpreneurship.

3. RESEARCH METHOD

3.1. Research Design

This study uses a Research and Development (R&D) approach to create an early reading enrichment book for pre-service primary school teachers, incorporating humanistic values, 21st-century skills, and entrepreneurial dimensions. The process includes design, testing, validation, field trials, and revisions. The book features CLS, NLP, and machine learning for dialect analysis, ensuring inclusivity. Humanistic values are embedded through interactive storytelling, collaborative reading, and reflective activities aligned with Vygotsky's sociocultural theory. It also promotes edupreneurship and digital transformation, supporting SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities) by fostering innovation and cultural preservation.

3.2. Research Procedure

This research procedure is in accordance with the research and development steps at level 4 which function to research and test to produce new products through the research stage, product design, and development stage [21, 22]. As shown in the following Figure 1:

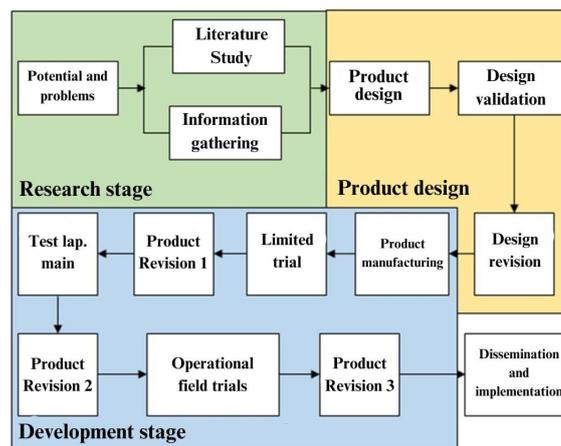


Figure 1. Steps for Level 4 Research and Development

3.2.1. Research Stage

In the first stage, the researcher identified issues in the Indonesian Language Learning course for elementary school teacher education students, which guided the product design. In the second stage, a thorough review of relevant books and journals was conducted, followed by discussions with informants, including lecturers, material experts, media experts, and practitioners, to gather insights for developing a solution to the identified problems.

3.2.2. Product Design

In the third stage, the researcher designed an early reading enrichment book that integrated humanistic values, 21st-century skills, and entrepreneurial dimensions, based on feedback from informants. Collaborating with an illustrator, the researcher created clear, professional visuals to effectively teach reading strategies to elementary school teacher education students. In the fourth stage, a Focus Group Discussion (FGD) was held with lecturers, material and media experts, and practitioners to gather input on the design. Based on this feedback, the researcher revised the design in the fifth stage to better align with the book's objectives.

3.2.3. Development Stage

The researcher developed a prototype of the enrichment book integrating humanistic values, 21st-century skills, and entrepreneurial dimensions. A limited field trial at Muhammadiyah University of Cirebon, involving observations, interviews, and questionnaires, led to the first revision. Main field testing at Swadaya Gunung Jati University, using pretests and posttests, resulted in a second revision. Operational testing at Muhadi Setiabudi University and PGRI Semarang University led to a third revision. Finally, the refined product was shared with lecturers and experts for further feedback.

3.3. Research Data and Data Sources

This study utilizes data sources and research subjects tailored to address each problem formulation. To analyze the condition of reference and enrichment books for early reading in the Primary School Teacher Education program, data is collected through surveys and teaching materials used in Indonesian Language Learning courses, with lecturers and students serving as subjects. Next, to identify the need for enrichment books that integrate humanist values and 21st-century skills, data is obtained through questionnaires and interviews with lecturers and students. For the development of the enrichment book, input is gathered from material and media experts via questionnaires, along with documents and articles on humanist values, 21st-century skills and entrepreneurial dimensions. Finally, to assess the effectiveness of the developed book, pretest and posttest data are collected from students at Muhammadiyah University of Cirebon to measure improvements in early reading comprehension and the integration of 21st-century skills.

3.4. Data Collection Technique

In this study, data collection techniques included the test method, questionnaire method, and interview method:

- Test method is pretests and posttests were administered to measure the effectiveness of the early reading enrichment book that contains humanist values, 21st-century skills and entrepreneurial dimensions. Test questions were used as the data collection instruments.
- Needs analysis questionnaire this questionnaire targeted lecturers and students to assess the need for enrichment books. For lecturers, it included indicators such as the need for enrichment books, compliance with Course Learning Outcomes (CLOs), material accuracy, presentation techniques, linguistic components, and evaluation needs. For students, it focused on their needs for the book's content, presentation, and evaluation.
- Expert questionnaire this was aimed at subject matter and media experts to validate the book's content and media before implementation.
- Material experts the questionnaire assessed content suitability, presentation, language, and the knowledge of early reading containing humanist values, 21st-century skills and entrepreneurial dimensions.
- Media experts the questionnaire focused on content quality, alignment with learning objectives, presentation design, feedback adaptability, motivation, ease of use, accessibility, and compliance with international standards.
- Interview method is interview guidelines were used for conducting structured interviews with subjects to gather in-depth feedback and insights related to the book's development and implementation.

3.5. Data Validity Technique

Data validation plays a crucial role in ensuring the reliability and accuracy of research findings. Before conducting data analysis, it's important to validate the data using specific criteria. To establish credibility, researchers employed techniques such as extending their presence at the study site (the college), conducting in-depth observations, and utilizing triangulation methods (sources, methods, researchers, and theories) to verify the data's validity. This process ensures that the information gathered from students and lecturers is accurate and reliable.

In this study, validity testing was applied to the scores from the needs analysis questionnaire. The validation process was based on content validity, which involved the evaluation by 2 expert lecturers in material and 2 expert lecturers in media. The purpose of validity testing is to assess the accuracy of the instrument in

measuring specific variables, which directly impacts data collection. To test the validity, the Pearson Product Moment correlation formula was used, which determines the relationship between the instrument's scores and the accuracy of the measured variables.

$$r_{xy} = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{\{n \sum x_i^2 - (\sum x_i)^2\} \cdot \{n \sum y_i^2 - (\sum y_i)^2\}}} \quad (1)$$

Information:

- r_{xy} = validation coefficient sought
- n = number of respondents
- X_i = score obtained by the subject in each item
- Y_i = total score obtained by the subject in all items
- $\sum X^2$ = sum of squares of variable X
- $\sum Y^2$ = sum of squares of variable Y

After calculating the validity index, then, a reliability test is carried out. A test can be said to be reliable if in several measurements of the same group of subjects the results are relatively the same. To test the reliability of this instrument, the KR.20 formula is used. The KR.20 formula is used to find the reliability with a score of 1 (for items answered correctly) and 0 (for items answered incorrectly). Where the KR.20 formula is as follows [23]:

$$r_{11} = \left[\frac{n}{n-1} \right] \left[\frac{S^2 - \sum pq}{S^2} \right] \quad (2)$$

Information:

- r_{11} = instrument reliability
- n = many questions
- p = proportion of subjects who answered the item correctly
- q = proportion of subjects who answered the item incorrectly ($q = 1 - p$)
- S = standard deviation of the test
- $\sum pq$ = the sum of the results of the multiplication of p and q .

In this study, the instrument is said to be reliable if r_{11} is more than 0.7.

3.6. Data Analysis Technique

The data analysis techniques in this study are described based on activities to answer the problem formulation as follows:

- Analysis of the development of early reading enrichment books is data from the lecturer and student needs questionnaires were analyzed qualitatively using miles and huberman's flow model, which includes data reduction, data presentation, and conclusion drawing. Interviews were also conducted to validate the questionnaire results.
- Analysis of the characteristics of enrichment books is data from document reviews related to the characteristics of teaching materials and FGDs with informants were analyzed using Miles and Huberman's qualitative method.
- Analysis of the design of enrichment books is data from document reviews related to the design of teaching materials and FGDs were analyzed qualitatively using the Miles and Huberman method.

- Effectiveness Analysis of Enrichment Books.
- The effectiveness of the enrichment books was measured using a paired sample t-test (pre-test and post-test) to compare two related samples.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} - 2r \left[\frac{S_1}{\sqrt{n_1}} \frac{S_2}{\sqrt{n_2}} \right]}} \quad (3)$$

Information:

- \bar{X}_1 = sample mean 1 (*pre-test*)
- \bar{X}_2 = sample mean 2 (*post-test*)
- S_1 = sample standard deviation 1
- S_2 = sample standard deviation 2
- S_{12} = sample variance 1
- S_{22} = sample variance 2
- r = correlation between data from two groups

4. RESULT AND DISCUSSION

Research findings reveal that the quality and relevance of reference and enrichment books for prospective elementary school teachers need improvement. Current materials, dominated by theoretical content, lack practical applications and fail to incorporate humanistic approaches and 21st-century skills critical for teaching [24]. Both lecturers and students highlight the need for enrichment books that are more interactive, contextual, and aligned with technological advancements. The use of teaching materials that are integrated with technology and humanistic values allows the learning process to be more interesting and relevant to students' current needs [25]. Students find existing materials difficult to apply during teaching practice, emphasizing the need for concrete examples and creative methods. Guided by Vygotsky's sociocultural theory, which stresses the importance of social interaction in language and reading development, enrichment books should integrate humanistic values like collaboration and critical thinking. The current books are deemed ineffective in fostering reading interest and teaching early reading skills. This research recommends developing innovative, technology-integrated enrichment books that address the demands of digital literacy and 21st-century education.

4.1. The Need to Develop Early Reading Enrichment Books Containing Humanist Values, 21st Century Skills and Entrepreneurial Dimensions

To meet the growing educational demands, early childhood reading enrichment books that contain humanist values and skills of this century are very important. Current materials often center on technical reading skills, but lack focus on creativity, critical thinking, and empathy, which are important components in preparing future elementary school teachers. This section examines the lack of existing resources and stresses how important it is to include grades and skills to improve teaching and student development. As a result, the following are the results of an analysis of the needs for enrichment books provided by lecturers and students.

Table 1. The Need Analysis (Students)

No.	Aspect	Indicator	Question Number	Percentage of Answer
1.	Need for enrichment books	A. Availability of early reading enrichment books	1	Agree (70%)
		B. The need for enrichment books containing humanist values, 21st century skills and entrepreneurial dimensions	2, 3, 4, 5	Agree (85%)

No.	Aspect	Indicator	Question Number	Percentage of Answer
1.	Need for enrichment books	A. Availability of early reading enrichment books	1	Agree (70%)
2.	Need for enrichment book materials	A. Exploring reading knowledge	6, 7, 8	Agree (80%)
		B. Accommodating life skills	9	Agree (78%)
3.	The need for enrichment book presentation	A. Presentation techniques	10, 11	Agree (75%)
		B. Completeness of presentation	12	Agree (82%)
4.	Need for linguistic components	A. In accordance with student development	13	Agree (88%)
		A. Quiz availability	14	Agree (70%)
5.	Evaluation needs	B. Availability of evaluation	15	Agree (76%)
		C. Availability of training in the form of projects	16	Agree (65%)
		A. Enrichment book design	17	Agree (83%)
Total			17	Agree (75%)

The Table 1 survey revealed that 75% of students were satisfied with the early reading enrichment books, while 25% saw room for improvement. Most students (85%) emphasized the importance of integrating humanistic values, 21st-century skills, and entrepreneurial dimensions. Additionally, 78% highlighted the need to include life skills, and 80% believed the materials should provide more in-depth reading knowledge. While 75% found the content engaging, 82% wanted more comprehensive material. Language use was well-received by 88% of students. Although 70%-76% were satisfied with quizzes and evaluations, only 65% felt project-based tasks were adequately integrated. Furthermore, 83% approved the book's design. These results indicate a strong demand for enrichment books that enhance reading skills while incorporating life skills, modern values, and engaging content.

The needs analysis conducted with lecturers and students highlights an urgent demand for more relevant and comprehensive early reading enrichment books that align with the demands of 21st-century education. Both groups agreed that the current books need improvement, particularly in integrating humanistic values, 21st-century skills, entrepreneurship dimensions, and providing content relevant to local culture to make it more engaging and interactive. Around 85% emphasized the importance of incorporating critical thinking, collaboration, and creativity. Additionally, 80% of students highlighted the need for deeper and more relevant content, which aligns with Vygotsky's theory that effective learning connects to the social and cultural context of students [26]. Furthermore, 75% of students expressed a desire for better presentation techniques, with 88% supporting the use of language that is appropriate and easy to understand, in line with Mayer's work on multimedia learning [27]. There was also a strong demand for more evaluation tools, such as quizzes and project-based tasks, supported by [28]. Overall, both lecturers and students seek enrichment books that not only enhance reading skills but also develop key 21st-century competencies in a practical, interactive, and relevant way for modern educational needs.

This is further supported by [29], which indicates that educational technology, such as local language learning apps, can be an effective tool for preserving culture while also promoting educational entrepreneurship. By integrating local wisdom into digital platforms, these applications support the preservation of traditions, expand access to learning, and create economic opportunities for local communities [30].

4.2. The Characteristics of Early Reading Enrichment Books Containing Humanist Values, 21st Century Skills and Entrepreneurial Dimensions for Pre-Service Teachers of Primary School Students that Will be Developed

In response to the identified needs, the development of early reading enrichment books for Pre-Service Teachers of Primary School students can integrate digital technology to enhance 21st-century skills, humanist value and entrepreneurial dimensions such as critical thinking, creativity, collaboration, and empathy [31]. These books can help preserve local culture, strengthen humanistic values, and create educational entrepreneurship opportunities for future teachers. Integrating these elements will shape well-rounded educators who are ready to meet the diverse and evolving needs of modern learners [32].

Table 2. The Result of Matter Expert

No.	Aspect	Indicator	Evaluation				
			1	2	3	4	5
1.	Content suitability	A. Suitability of material with CLOs (CPMK)					✓
		B. Completeness of materials					✓
		C. Breadth of material					✓
		D. Depth of material					✓
		E. Accuracy of material				✓	
		F. Update of materials					✓
		G. Encouraging curiosity					✓
2.	Presentation eligibility	A. Presentation techniques					✓
		B. Presentation support					✓
		C. Presentation of learning					✓
		D. The sequence of thought					✓
3.	Language eligibility	A. Communicative					✓
		B. Straightforward					✓
		C. Interactive					✓
		D. Easy to understand					✓
		E. Use of terms, symbols, or icons					✓
4.	Assessment of initial reading knowledge containing humanist values, 21st century skills and entrepreneurial dimensions	A. Beginning Reading Elements					✓
		B. Beginning reading steps containing humanist values, 21st century skills and entrepreneurial dimensions.					✓

The Table 2 reading enrichment books are considered to have strong content, presentation, and language, aligning well with the CLOs. These books effectively foster students' curiosity through comprehensive material, logical presentation, and communicative, easy to understand language [33]. However, the accuracy of content and integration of humanistic values, 21st-century skills, entrepreneurial elements, and early reading components still need improvement. A culturally rooted digital app approach can further boost the book's relevance. Educational technology has proven effective in supporting interactive learning while preserving cultural heritage, as demonstrated by [34]. Integrating these elements can also contribute to achieving SDGs 4 and SDGs 10.

Table 3. The Result of Media Expert

No.	Aspect	Indicator	Evaluation				
			1	2	3	4	5
1.	Content Quality	A. Accuracy (precision)					✓
		B. Balanced presentation of ideas					✓
		C. Appropriate level of detail					✓
		D. Can be reused in various contexts					✓
2.	Learning Goal Alignment	A. Alignment between learning objectives					✓
		B. Activities					✓
		C. Evaluation					✓

No.	Aspect	Indicator	Evaluation				
			1	2	3	4	5
3.	Feedback and Adaptation	A. Adaptive content or feedback driven by different learner inputs or learner modeling					✓
4.	Motivation	A. Ability to motivate and engage an identified student population					✓
5.	Presentation Design	A. Visual information design to enhance learning					✓
		B. Design content information to enhance learning					✓
		C. Streamlining mental processes					✓
6.	Ease of use (Interaction Usability)	A. Ease of navigation					✓
		B. User interface predictability					✓
		C. Quality of interface help features					✓
7.	Accessibility	A. Design controls to accommodate students with disabilities and mobile learners					✓
		B. Presentation formats to accommodate students with disabilities and mobile learners					✓
8.	Comply with standards (Standards Compliance)	A. Compliance with international standards					✓
		B. Operation on commonly used technical platforms					✓

The Table 3 early reading enrichment materials demonstrate strong quality in accuracy, presentation, and flexibility, effectively aligning with learning objectives. They are engaging, user-friendly, and adaptable to students' needs, though further improvements are required to enhance accessibility and compatibility. An ideal enrichment book should feature factual, balanced content with objectives, activities, and assessments aligned with Bloom's Taxonomy. It should adapt to diverse learning preferences, promote active participation, and present information in a visually and cognitively appealing format. Following Universal Design for Learning principles, the book must be inclusive for all students, including those with disabilities.

To support 21st-century skills and cultural preservation, the book should incorporate adaptive, relevant content and leverage technology, such as locally inspired applications, to enhance engagement. This approach, emphasizes motivation-based presentation for improved learning outcomes. Aligning with SDGs 4 and SDGs 10, the integration of humanistic values, project-based assessments, and a user-friendly interface ensures the book's effectiveness as an innovative learning resource.

4.3. The Design of A Beginning Reading Enrichment Book Containing Humanist Values, 21st Century Skills and Entrepreneurial Dimensions for Pre-Service Teachers of Primary School Students that will be Developed

Based on assessments from media and subject matter experts, the design of the early reading enrichment book emphasizes reliability, aesthetics, ease of navigation, and student motivation and engagement. The content of this book is guaranteed to align with the CLOs and is based on well-structured learning principles. The visual design follows Mayer's Cognitive Theory of Multimedia Learning, ensuring a clear presentation flow while minimizing cognitive load [35]. Interactive components and intrinsic motivation are also integrated, grounded in Self-Determination Theory, to support active learning. Furthermore, accessibility is a priority, adopting the principles of Universal Design for Learning, making the book inclusive for all students, including those with disabilities [36]. Compatibility with common technology platforms ensures widespread usability. The development of this book can be integrated into local language learning apps, supporting cultural preservation and interactive education, in line with the concept of edupreneurship. Apps based on dialectology or technology-based teaching tools open monetization opportunities through digital models [37]. The findings of this research support SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities), as the integration of local languages in educational technology enhances access to quality education and the preservation of local

cultures. Technology that facilitates the learning of local languages and cultures can reduce disparities and introduce innovative technology-based solutions for more inclusive and sustainable education [38].

4.4. The Effectiveness of Early Reading Enrichment Books Containing Humanist Values, 21st Century Skills and Entrepreneurial Dimensions for Pre-Service Teachers of Primary School Students that will be Developed

The purpose of this part is to objectively evaluate the efficacy of the early reading enrichment books that integrate humanist ideals, 21st-century skills and entrepreneurial dimensions and were created for Pre-Service Teachers of Primary School students. To assess how much the students' early reading skills have improved, the pretest and posttest data will be compared. Furthermore, the research will investigate how the inclusion of critical thinking, creativity, empathy, and teamwork in the materials improves students' social and cognitive development two essential components of education in the twenty-first century. The Table 4 are anticipated to offer empirical proof of the enrichment books' influence on Pre-Service Teachers of Primary School students' character development and academic achievement, hence establishing their overall effectiveness in promoting holistic learning.

Table 4. The Result of Pretest and Post-test

No.	Name	Pre-test	Post-Test
1.	Pre-service Teacher 1	56	61
2.	Pre-service Teacher 2	40	83
3.	Pre-service Teacher 3	41	88
4.	Pre-service Teacher 4	34	77
5.	Pre-service Teacher 5	35	65
6.	Pre-service Teacher 6	55	71
7.	Pre-service Teacher 7	30	85
8.	Pre-service Teacher 8	25	81
9.	Pre-service Teacher 9	45	64
10.	Pre-service Teacher 10	48	88
11.	Pre-service Teacher 11	45	75
12.	Pre-service Teacher 12	45	81
13.	Pre-service Teacher 13	45	67
14.	Pre-service Teacher 14	40	71
15.	Pre-service Teacher 15	30	82
16.	Pre-service Teacher 16	46	83
17.	Pre-service Teacher 17	53	64
18.	Pre-service Teacher 18	50	63
19.	Pre-service Teacher 19	45	81
20.	Pre-service Teacher 20	45	65
21.	Pre-service Teacher 21	49	77
22.	Pre-service Teacher 22	40	84
23.	Pre-service Teacher 23	50	64
24.	Pre-service Teacher 24	55	87
25.	Pre-service Teacher 25	60	70
26.	Pre-service Teacher 26	63	85
27.	Pre-service Teacher 27	55	63
28.	Pre-service Teacher 28	50	62
29.	Pre-service Teacher 29	45	89
30.	Pre-service Teacher 30	45	77
Mean Score		45.5	75.1
Percentage (%)		46%	75%

The pretest and posttest results from 30 students showed significant improvement in early reading skills, confirming the effectiveness of the enrichment book. The posttest score increased from 45.5 to 75.1,

reflecting a rise from 46% to 75%. This improvement supports the study's goal of enhancing 21st-century skills and entrepreneurial competencies through critical thinking, digital learning, and interactive reading activities. The book, designed with humanistic values and skills such as empathy, creativity, and collaboration, boosted both reading abilities and engagement, emphasizing the need for adaptive, tech-enhanced resources in teacher training [39]. Furthermore, educational media combined with technology promotes inclusive learning, with local language apps preserving cultural heritage and supporting educational entrepreneurship. These findings highlight the value of embedding 21st-century skills in materials to boost engagement, teamwork, and achievement, particularly in literacy. Prior research also supports the role of entrepreneurial ecosystems and local-global approaches in developing culturally relevant digital content and educational games, aiding in language and culture preservation [40].

The pretest and posttest results prove that this media is beneficial in improving student learning outcomes, especially in reading. This development supports the goals of SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities). Through Edupreneurship and innovation in educational media, more inclusive and quality education can be created, providing access to students from various backgrounds, including those with disabilities, to receive relevant and comprehensive materials. Thus, the results of this study not only support the achievement of SDGs-related quality education but also create new economic opportunities through education-based entrepreneurship and technology that supports the preservation of local culture. Then it can be seen the process of calculating the average percentage of student's post-test scores using IBM SPSS 22:

Table 5. Paired Samples Statistics

		Mean	Std. Deviation	Std. Error Mean
Pair 1	Pretest	45.50	8.885	1.622
	Posttest	75.10	9.455	1.726

The Table 5 showed a significant improvement in student outcomes after using the early reading enrichment book. The average pretest score was 45.50, while the posttest score increased to 75.10, resulting in a mean difference of 29.60 points. The t-value of -10.99 and p-value of 0.000 confirm that this improvement is statistically significant, indicating that the observed performance boost is not due to chance, and highlighting the book's effectiveness in enhancing student learning.

Table 6. Paired Samples Test

		Paired Differences				T	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval				
					Lower	Upper			
Pair 1	Pretest- Posttest	-29,600	14.759	2.695	-35.111	-24.089	-10.985	29	0.000

Furthermore, the 95% confidence interval for the difference, ranging from -35.11 to -24.09, further strengthens the reliability of these findings. This range suggests that the observed improvement is consistent and trustworthy, supporting the validity and accuracy of the research results.

The Table 6 substantial improvement in the posttest score suggests that the enrichment book, which incorporates humanistic values, 21st-century skills, and entrepreneurial components, plays a crucial role in enhancing students' reading skills. This increase in performance highlights the effectiveness of the book in fostering a deeper understanding of early reading concepts and competencies, demonstrating its value as an educational tool.

In addition, the integration of technology within the educational media not only facilitates learning but also supports the preservation of culture and language through edupreneurship. By offering innovative solutions, this approach aligns with the goals of the Sustainable Development Goals (SDGs), especially SDGs 4, which aims to ensure quality education for all, and SDGs 10, focused on reducing inequalities. Therefore, the intervention has proven to be successful in improving learning outcomes. The combination of educational technology, cultural preservation, and a focus on 21st-century skills has contributed to a inclusive learning environment, making strides toward achieving both educational and social objectives.

5. MANAGERIAL IMPLICATIONS

5.1. Enhancing Learning Quality through Innovation

Managers should support the integration of humanistic values, 21st-century skills, and entrepreneurial dimensions into teaching materials, as seen in the early reading enrichment book. This approach prepares students for future challenges and enhances reading skills, aligning with modern educational needs.

5.2. Leveraging Technology in Education

The use of technology in education, such as digital learning platforms, supports cultural and language preservation. Managers should invest in tech-driven solutions that improve access to quality education, aligning with SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities).

6. CONCLUSION

The study concludes that early reading enrichment books integrating 21st-century skills, humanistic values, and entrepreneurial dimensions enhance student outcomes while fostering critical skills like critical thinking, creativity, teamwork, and empathy. The significant increase in posttest scores underscores the positive effect of these materials on both academic performance and overall student development. The findings also highlight the role of edupreneurship in addressing educational challenges and creating opportunities for education-based entrepreneurship. By developing culturally relevant content, such as educational games or language apps, this approach promotes creativepreneurship and digitalpreneurship, combining creativity, technology, and entrepreneurship for greater impact. Moreover, edupreneurship contributes to quality learning products, while digitalpreneurship enables global expansion of tech-based educational solutions. This supports SDGs, particularly SDGs 4 (Quality Education) and SDGs 10 (Reduced Inequalities), by offering inclusive, locally-based learning solutions. However, the study's small sample size and focus on reading alone highlight the need for broader research to explore other factors impacting learning outcomes.

7. DECLARATIONS

7.1. About Authors

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7.2. Author Contributions

Conceptualization: PN; Methodology: SU; Software: RP; Validation: HI and JW; Formal Analysis: SU and PN; Investigation: RP; Resources: HI; Data Curation: SU; Writing Original Draft Preparation: PN and RP; Writing Review and Editing: RP and PN; Visualization: RP; All authors, PN, SU, RP, HI, and JW have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

- [1] M. Bruggink, N. Swart, A. van der Lee, and E. Segers, "Evidence-based didactic principles for digital reading: An overview of evidence-based didactic principles for digital reading," in *Teaching Reading Comprehension in a Digital World: Evidence-Based Contributions Using PIRLS and Digital Texts*, 2025, pp. 19–43.
- [2] N. R. Panel, "Report of the national reading panel: Teaching children to read," 2022, accessed: 2025-02-24.
- [3] R. Elmoazen, M. Saqr, M. Tedre, and L. Hirsto, "A systematic literature review of empirical research on epistemic network analysis in education," *IEEE Access*, vol. 10, pp. 17 330–17 348, 2022.
- [4] J. Carter, "Supporting preservice teachers to become informed teachers of reading through one-to-one tutoring in an english initial teacher education setting," *International Journal of Primary, Elementary, and Early Years Education*, vol. 51, no. 4, pp. 543–556, 2023.
- [5] B. S. Haug and S. M. Mork, "Taking 21st century skills from vision to classroom: What teachers highlight as supportive professional development in the light of new demands from educational reforms," *Teaching and Teacher Education*, vol. 100, p. 103286, 2021.
- [6] T. Farahdiba and N. Amaliyah, "The teacher's role to increase students' reading interest using picture word card media in grade i penggilingan 01 elementary school," *Jurnal Pemikiran dan Pengembangan Sekolah Dasar (JP2SD)*, vol. 13, no. 1, 2025.
- [7] G. Guruganesh, Y. Kolombus, J. Schneider, I. Talgam-Cohen, E. V. Vlatakis-Gkaragkounis, J. R. Wang, and S. M. Weinberg, "Contracting with a learning agent," *arXiv preprint*, vol. arXiv:2401.16198, 2024.
- [8] E. Mulatu and T. Regassa, "Teaching reading skills in efl classes: Practice and procedures teachers use to help learners with low reading skills," *Cogent Education*, vol. 9, no. 1, 2022.
- [9] K. Diantoro, D. Supriyanti, Y. P. A. Sanjaya, and S. Watini, "Implications of distributed energy development in blockchain-based institutional environment," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 5, no. 2sp, pp. 209–220, 2023.
- [10] A. B. et al., "Understanding the role of study strategies and learning disabilities on student academic performance to enhance educational approaches: A proposal using artificial intelligence," *Computers in Education: Artificial Intelligence*, vol. 6, no. September 2023, 2024.
- [11] E. O. Bereczki and A. Kárpáti, "Technology-enhanced creativity: A multiple case study of digital technology-integration expert teachers' beliefs and practices," *Thinking Skills and Creativity*, vol. 39, no. November 2020, p. 100791, 2021.
- [12] S. Downie and S. Proulx, "Investigating the role of gamification in public libraries' literacy-centered youth programming," *International Journal of Play*, vol. 11, no. 4, pp. 382–404, 2022.
- [13] S. P. D. J. C. Lukita, M. Hardini and N. P. L. Santoso, "Transformation of entrepreneurship and digital technology students in the era of revolution 4.0," *APTISI Transactions on Technopreneurship*, vol. 5, no. 3, pp. 291–304, 2023.
- [14] B. Amirah and A. Saidalvi, "Talking story: Ebooks to improve reading comprehension skills," in *Embracing Change: Emancipating the Landscape of Research in Linguistics, Language and Literature, International Conference of Research on Language Education 2023*, 2023, pp. 259–271. [Online]. Available: <https://ir.uitm.edu.my/id/eprint/82014/>
- [15] N. Rakha, "Revolution in learning through digitization: How technology is changing the landscape of education," *International Journal of Cyber Law*, vol. 1, no. 3, pp. 1–16, 2023.
- [16] A. C. Rapp and A. Corral-Granados, "Understanding inclusive education – a theoretical contribution from system theory and the constructionist perspective," *International Journal of Inclusive Education*, vol. 28, no. 4, pp. 423–439, 2024.
- [17] F. Nurutdinova, A. Madjidov, Y. Rasulova, N. Amonova, H. Amonova, and S. Tokhtayev, "Improvement of laboratory courses in biochemistry for medical students using an electronic textbook," in *BIO Web of Conferences*, vol. 121. EDP Sciences, 2024, p. 01017.
- [18] L. Dorn and T. Jones, *Apprenticeship in Literacy: Transitions Across Reading and Writing, K-4*, 2nd ed. Routledge, 2023.
- [19] T. Hasanzade, "Enhancing reading skills in young learners: Strategies for structuring engaging literacy lessons," *Porta Universorum*, vol. 1, no. 4, pp. 205–211, 2025.
- [20] A. Germain-Rutherford and B. Karamifar, "Conceptualizing innovation in language education: Holistic and reflective teaching and learning," *Educational Linguistics*, vol. 55, 2022.

- [21] D. E. Rose, J. Van Der Merwe, and J. Jones, "Digital marketing strategy in enhancing brand awareness and profitability of e-commerce companies," *APTISI Transactions on Management*, vol. 8, no. 2, pp. 160–166, 2024.
- [22] E. Huber, L. Harris, S. Wright, A. White, C. Radulescu, S. Zeivots, and A. Brodzeli, "Towards a framework for designing and evaluating online assessments in business education," *Assessment & Evaluation in Higher Education*, vol. 49, no. 1, pp. 102–116, 2024.
- [23] I. Khong, N. Aprila Yusuf, A. Nuriman, and A. Bayu Yadila, "Exploring the Impact of Data Quality on Decision-Making Processes in Information Intensive Organizations," *APTISI Transactions on Management (ATM)*, vol. 7, no. 3, pp. 253–260, 2023.
- [24] R. J. Chenail, "Continuing to meet qualitative researcher's needs: Johnny saldaña's developing theory through qualitative inquiry," *The Qualitative Report*, vol. 29, no. 11, pp. 2964–2967, 2024.
- [25] L. M. et al., "Rethinking the entwinement between artificial intelligence and human learning: What capabilities do learners need for a world with ai?" *Computers in Education: Artificial Intelligence*, vol. 3, no. February, 2022.
- [26] A. Nuche, O. Sy, and J. C. Rodriguez, "Optimizing efficiency through sustainable strategies: The role of management and monitoring in achieving goals," *APTISI Transactions on Management*, vol. 8, no. 2, pp. 167–174, 2024.
- [27] S. A. O. M. N. A. N. R. Y. A. Ajani, B. D. Oladokun and M. T. Bashorun, "Revitalizing indigenous knowledge systems via digital media technologies for sustainability of indigenous languages," *Preservation and Digital Technology for Culture*, vol. 53, no. 1, pp. 35–44, 2024.
- [28] N. Mirra and A. Garcia, "In search of the meaning and purpose of 21st-century literacy learning: A critical review of research and practice," *International Literacy Association*, vol. 56, no. 3, pp. 463–496, 2021.
- [29] A. Leffia, A. C. Kiboyi, and R. F. Terizla, "Implementation of the use of artificial intelligence in higher education," *Blockchain Frontier Technology*, vol. 3, no. 2, pp. 150–153, 2024.
- [30] Y. Adhikari, *A Review of Revised Bloom's Taxonomy of Educational Objectives*. Education Review Office, 2024.
- [31] N. Kottacheruvu and S. Jampa, "Strategies for managing mixed ability classes in english language teaching," *International Journal*, vol. 5, no. 10, pp. 4069–4073, 2024.
- [32] C. Hubley, J. Edwards, D. B. Miele, and A. A. Scholer, "Metamotivational beliefs about intrinsic and extrinsic motivation," *Journal of Personality and Social Psychology*, vol. 126, no. 1, p. 26, 2024.
- [33] Emilyani, M. Grace Hardini, N. Aprila Yusuf, and A. Rahmania Az Zahra, "Convergence of Intelligent Networks: Harnessing the Power of Artificial Intelligence and Blockchain for Future Innovations," *ADI Journal on Recent Innovation (AJRI)*, vol. 5, no. 2, pp. 200–209, 2024.
- [34] UNESCO, "Reimagining our futures together a new social contract for education," 2021, futures of Education flagship report. [Online]. Available: https://unevoc.unesco.org/pub/futures_of_education_report_eng.pdf
- [35] V. J.-S. F. L. Z. Xu, A. Sukumar and R. Tomlins, "Local-global design: entrepreneurial ecosystem approach for digital gaming industry," *International Journal of Technology Transfer and Commercialization*, vol. 18, no. 4, pp. 418–438, 2021. [Online]. Available: <https://www.inderscienceonline.com/doi/pdf/10.1504/IJTTC.2021.120204>
- [36] S. Deo, M. Hinchcliff, N. T. Thai, M. Papakosmas, P. Chad, T. Heffernan, and B. Gibbons, "Educating for the sustainable future: A conceptual process for mapping the united nations sustainable development goals in marketing teaching using bloom's taxonomy," *Journal of Marketing Education*, vol. 46, no. 2, pp. 84–96, 2024.
- [37] M. Ajeng, A. Kirei, and K. Amanda, "Blockchain technology application for information system security in education," *Blockchain Frontier Technology*, vol. 3, no. 1, pp. 26–31, 2023.
- [38] J. A. Monica, J. H. Malar, C. Arun, L. Sharmila, and M. Arif, "Leveraging technology and universal design for inclusive and engaging learning in indian higher education," in *Educational Philosophy and Sociological Foundation of Education*. IGI Global, 2025, pp. 177–212.
- [39] Y. S. G. Kim and C. Snow, "Advancing the science of teaching reading: Introduction to the special issue," *Scientific Studies of Reading*, vol. 29, no. 1, pp. 1–6, 2025.
- [40] M. Annas, T. Handra, C. S. Bangun, U. Rahardja, and N. Septiani, "Reward and promotion: Sustainable value of post pandemic efforts in medical cold-supply chain," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 1, pp. 109–118, 2024.
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